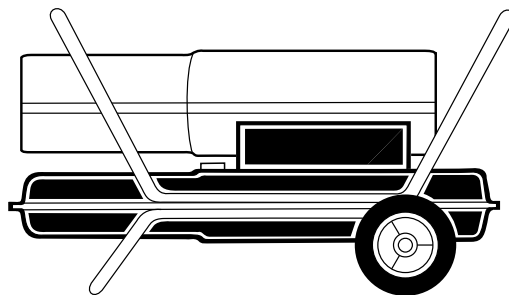
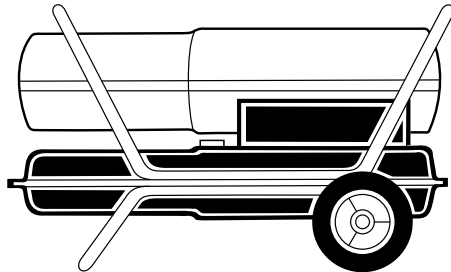
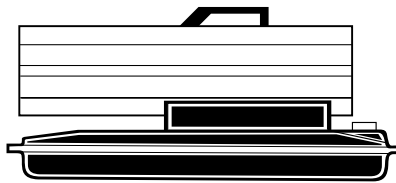


MASTER[®]

PORTABLE FORCED AIR HEATERS

OWNER'S MANUAL



Heater Sizes: 70,000 100,000 150,000 BTU/Hr

IMPORTANT

Read and understand this manual before assembling, starting or servicing heater. Improper use of heater can cause serious injury. Keep this manual for future reference.

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SAFETY INFORMATION

WARNINGS

IMPORTANT: Read this owner's manual carefully and completely before trying to assemble, operate, or service this heater. Improper use of this heater can cause serious injury or death from burns, fire, explosion, electrical shock, and carbon monoxide poisoning.

DANGER

Carbon monoxide poisoning may lead to death!

Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, or nausea. If you have these signs, the heater may not be working properly. **Get fresh air at once!** Have heater serviced. Some people are more affected by carbon monoxide than others. These include pregnant women, persons with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.

Make certain you read and understand all warnings. Keep this manual for reference. It is your guide to safe and proper operation of this heater.

- Use only kerosene or No. 1 fuel oil to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol, or other highly flammable fuels.
- Never use heater where gasoline, paint thinner, or other highly flammable vapors are present.
- Follow all local ordinances and codes when using heater.
- Use only in well-vented areas. Provide at least a three-square-foot (2800 square cm) opening of fresh, outside air for each 100,000 BTU/Hr of rating.
- Use only in places free of flammable vapors or high dust content.
- Use only with the electrical voltage and frequency specified on model plate.
- Use only a three-wire, grounded (earthed) extension cord.
- Minimum heater clearances from combustibles:
Outlet: 8 Ft. (250 cm) Sides, Top, and Rear: 4 Ft. (125 cm)
- Locate heater on a stable and level surface while hot or running or a fire may occur.
- When moving or storing heater, keep heater in a level position or fuel spillage may occur.
- Keep children and animals away from heater.
- Unplug heater when not in use.
- When used with thermostat, heater may start anytime.
- Never use heater in living or sleeping areas.
- Never block air inlet (rear) or air outlet (front) of heater.
- Never move, handle, refuel, or service a hot, operating, or plugged-in heater.
- Never attach duct work to front or rear of heater.

PRODUCT IDENTIFICATION

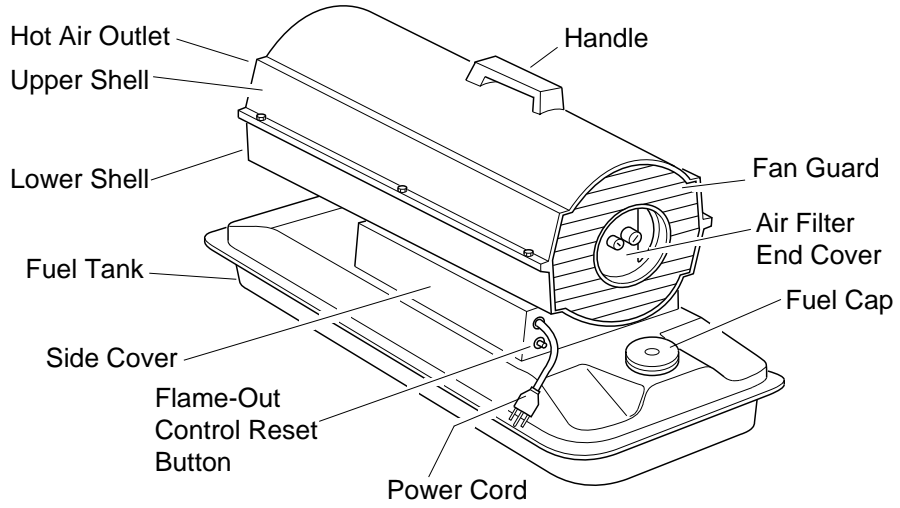


Figure 1 - 70,000 BTU/Hr Model

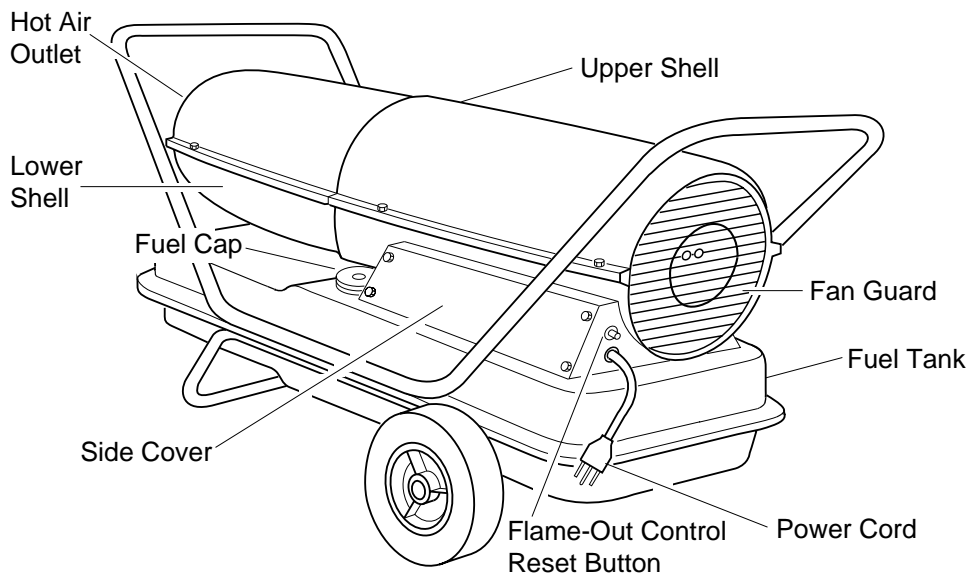


Figure 2 - 100,000 BTU/Hr Model

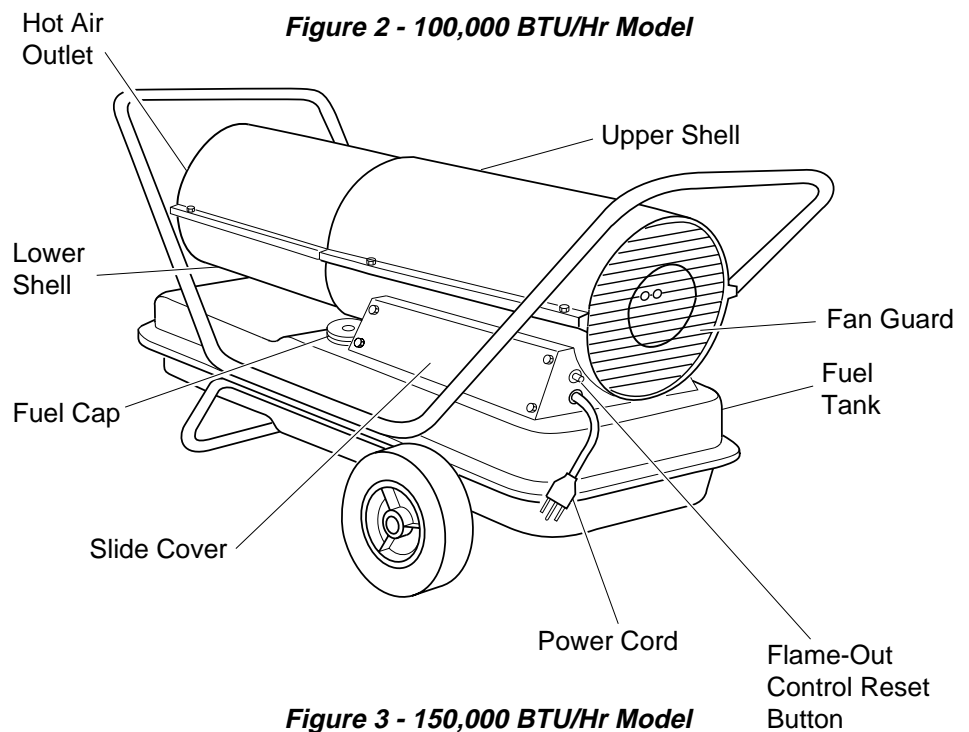


Figure 3 - 150,000 BTU/Hr Model

UNPACKING

ASSEMBLY

(For 100,000 and 150,000
BTU/Hr Models Only)

1. Remove all packing items applied to heater for shipment.
2. Remove all items from carton.
3. Check items for any shipping damage. If heater is damaged, promptly inform dealer where you bought heater.

These models are furnished with wheels and handles. Wheels, handles, and the mounting hardware are found in the shipping carton.

Tools Needed

- Medium Phillips Screwdriver
 - 3/8" Open or Adjustable Wrench
 - Hammer
1. Slide axle through wheel support frame. Install wheels on axle.
IMPORTANT: When installing wheels, point extended hub of wheels toward wheel support frame (see Figure 4).
 2. Place cap nuts on axle ends. Gently tap with hammer to secure.
 3. Place heater on wheel support frame. Make sure air inlet end (rear) of heater is over wheels. Line up holes on fuel tank flange with holes on wheel support frame.
 4. Place front handle and rear handle on top of fuel tank flange. Insert screws through handles, fuel tank flange, and wheel support frame. Attach nut finger tight after each screw is inserted.
 5. After all screws are inserted, tighten nuts firmly.

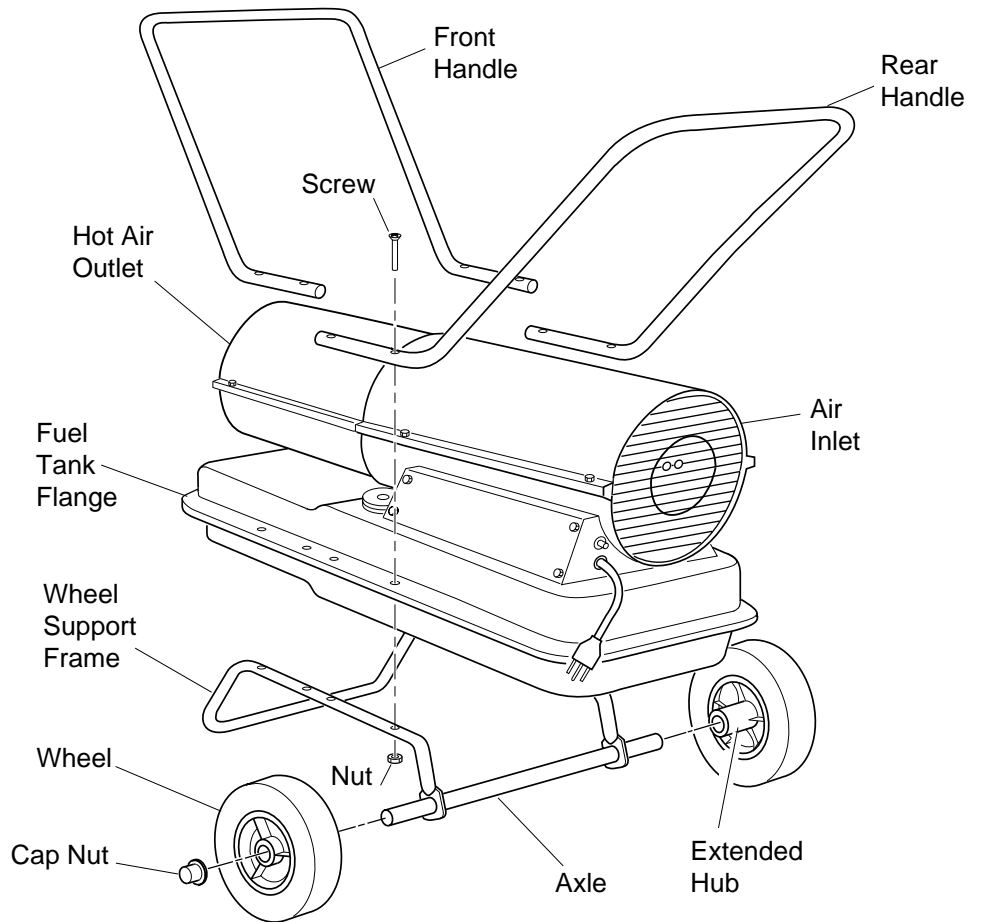


Figure 4 - Wheel and Handle Assembly, 100/150,000 BTU/Hr Models Only

THEORY OF OPERATION

The Fuel System: The air pump forces air through the air line. The air is then pushed through the burner head nozzle. This air causes fuel to lift from the tank. A fine mist of fuel is sprayed into the combustion chamber.

The Air System: The motor turns the fan. The fan pushes air into and around the combustion chamber. This air is heated and provides a stream of clean, hot air.

The Ignition System: The electronic ignitor sends voltage to the spark plug. The spark plug ignites the fuel and air mixture.

The Flame-Out Control System: This system causes the heater to shut down if the flame goes out.

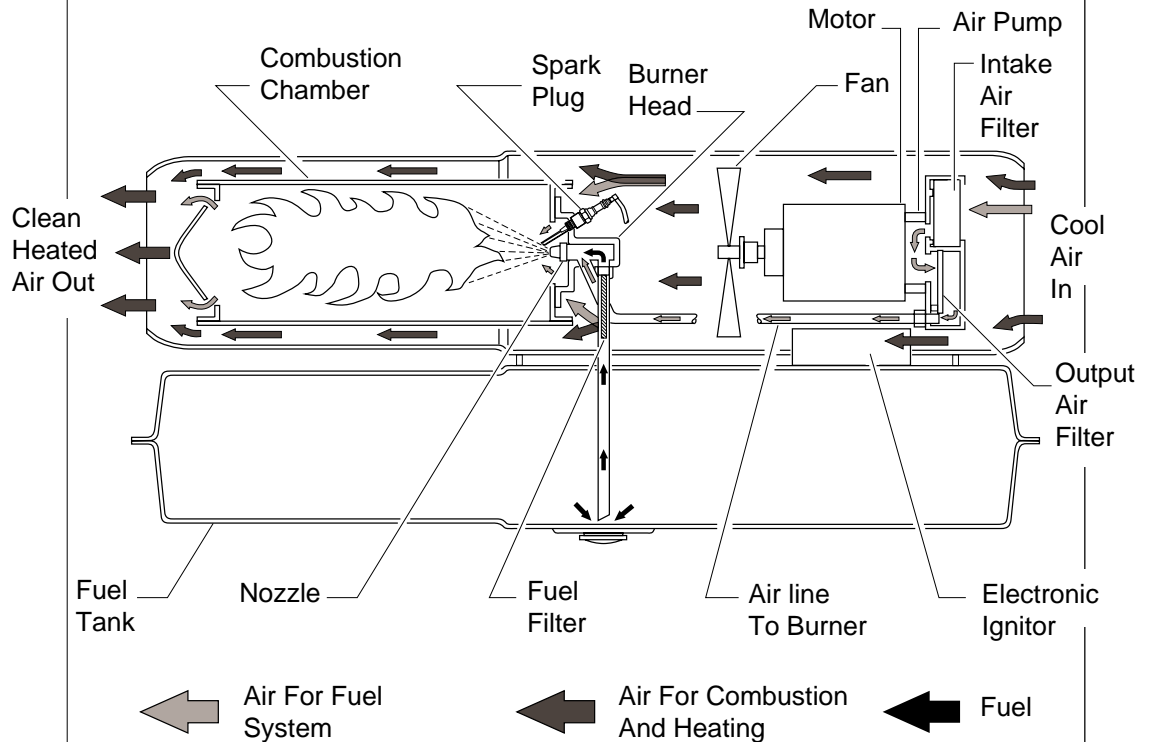


Figure 5 - Cross Section Operational View

FUELS

⚠ WARNING

Use only kerosene or No. 1 fuel oil to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol or other highly flammable fuels.

Do not use heavy fuels such as No. 2 fuel oil or No. 2 Diesel. Using heavy fuels will result in:

- clogged fuel filter and nozzle
- carbon build up on spark plug
- use of non-toxic anti-icer in fuel during very cold weather

IMPORTANT: Use a KEROSENE ONLY container. Be sure storage container is clean. Foreign matter such as rust, dirt, or water will cause the flame-out control to shut down heater. Foreign matter may also require you to clean fuel system often.

VENTILATION

⚠️ WARNING

Follow the minimum fresh, outside air ventilation requirements. If proper fresh, outside air ventilation is not provided, carbon monoxide poisoning can occur. Provide proper fresh, outside air ventilation before running heater.

Provide a fresh air opening of at least three square feet (2800 square cm) for each 100,000 BTU/Hr rating. Provide extra fresh air if more heaters are being used.

Example: A 150,000 BTU/Hr heater requires one of the following:

- a two-car garage door raised six inches (15.24 cm)
- a single-car garage door raised nine inches (22.86 cm)
- two, thirty-inch (76.20 cm) windows raised twelve inches (30.48 cm)

OPERATION

⚠️ WARNING

Review and understand the warnings in the *Safety Information Section*, page 3. They are needed to safely operate this heater. Follow all local codes when using this heater.

To Start Heater

1. Follow all ventilation and safety information.
2. Fill fuel tank with kerosene or No. 1 fuel oil.
3. Attach fuel cap.
4. Plug power cord of heater into standard 230 volt/50 hertz, grounded (earthed) outlet. Use an extension cord if needed. Use only a three-wire, grounded (earthed) extension cord.

Extension Cord Wire Size Requirements

Up to 100 feet (30.5 meters) long, use 16 AWG (1.0 mm²) conductor

101 to 200 feet (30.6 to 61 meters) long, use 14 AWG (1.5 mm²) conductor

Heater will start when power cord is plugged into outlet. If not, push in flame-out control reset button (see Figures 6 and 7).

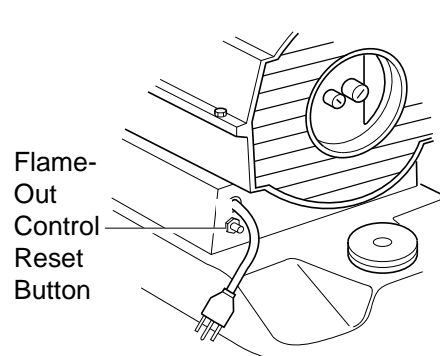


Figure 6 - Flame-Out Control Reset Button, 70,000 BTU/Hr Model

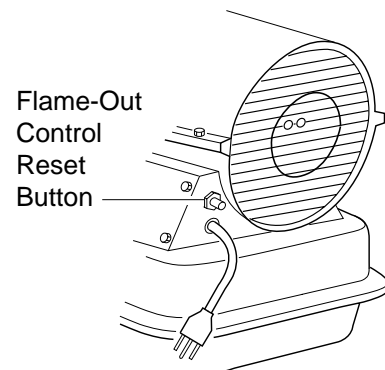


Figure 7 - Flame-Out Control Reset Button, 100/150,000 BTU/Hr Models

Continued

OPERATION

Continued

STORAGE

To Stop Heater

1. Unplug power cord from outlet.

To Restart Heater

1. Wait 2 minutes after stopping heater.
2. Repeat steps under *To Start Heater*, page 7.

1. Drain fuel tank.

Note: Some models have drain plug on underside of fuel tank. If so, remove drain plug to drain all fuel. If heater does not have drain plug, drain fuel through fuel cap opening. Be sure all fuel is removed.

2. Replace drain plug if used.
3. Add one gallon (4 liters) of clean kerosene to fuel tank.
4. Attach fuel cap.
5. Move heater forwards and backwards to stir fuel.
6. Remove fuel cap or drain plug and drain fuel tank. Be sure all fuel is removed.
7. Replace fuel cap or drain plug. Properly dispose of old and dirty fuel.
8. Store heater in dry place. Make sure storage place is free of dust and corrosive fumes.

IMPORTANT: Do not store kerosene over summer months for use during next heating season. Using old fuel could damage heater.

WARNING

Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.


PREVENTATIVE MAINTENANCE SCHEDULE

<u>Item</u>	<u>How Often</u>	<u>How To</u>
Fuel tank	Flush every 150-200 hours of operation or as needed.	See <i>Storage</i> above.
Air output and	Replace every 500 hours of lint filters operation or once a year.	See <i>Air Output, Air Intake, and Lint Filters</i> , page 12.
Air intake filter	Wash and dry with soap and water every 500 hours of operation or as needed.	See <i>Air Output, Air Intake, and Lint Filters</i> , page 12.
Fuel filter	Clean twice a heating season or as needed.	See <i>Fuel Filter</i> , pages 10 and 11.
Spark plug	Clean and regap every 600 hours operation or replace as needed.	See <i>Spark Plug</i> , page 11.
Fan blades	Clean every season or as needed.	See <i>Fan</i> , page 15.
Motor	Not required/permanently lubricated	

TROUBLE-SHOOTING

WARNING

Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

<u>OBSERVED FAULT</u>	<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>
Heater ignites, but flame-out control shuts off heater after a short period of time	Wrong pump pressure	See <i>Pump Pressure Adjustment</i> , page 12.
	Dirty air output, air intake, and lint filters	See <i>Air Output, Air Intake and Lint Filters</i> , page 12.
	Dirty fuel filter	See <i>Fuel Filter</i> , pages 10 and 11.
	Dirt in nozzle	See <i>Nozzle</i> , page 13.
	Dirty photocell lens	Clean photocell lens.
	Bad flame-out control	Replace flame-out control.
Heater will not ignite, but motor runs for a short period of time.	Wrong pump pressure	See <i>Pump Pressure Adjustment</i> , page 12.
	Carbon deposits on spark plug and/or improper gap	See <i>Spark Plug</i> , page 11.
	Dirty fuel filter	See <i>Fuel Filter</i> , pages 10 and 11.
	Dirt in nozzle	See <i>Nozzle</i> , page 13.
	Water in fuel tank	Drain and flush fuel tank with clean kerosene. See <i>Storage</i> , page 8.
	 WARNING: High voltage!	
	Electronic ignitor not grounded (earthed)	Make sure electronic ignitor mounting is tight.
	Bad electronic ignitor	Replace electronic ignitor.
Motor does not start when heater is plugged in, fan rotates slowly or does not turn.	Flame-out control not reset	Reset flame-out control button, see Figures 6 and 7, page 7.
	Binding pump rotor	If fan is hard to turn, see <i>Pump Rotor</i> , page 14.

SERVICE PROCEDURES

⚠ WARNING

Never service heater while it is plugged in, operating, or hot. Severe burns and electrical shock can occur.

Upper Shell Removal

1. Remove screws along each side of heater using 5/16" nut-driver. These screws attach upper and lower shells together.
2. Lift upper shell off.
3. Remove fan guard.

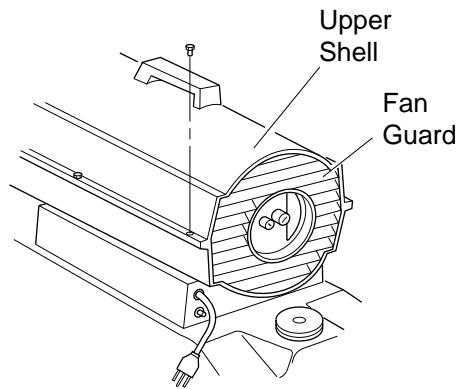


Figure 8 - Upper Shell Removal, 70,000 BTU/Hr Model

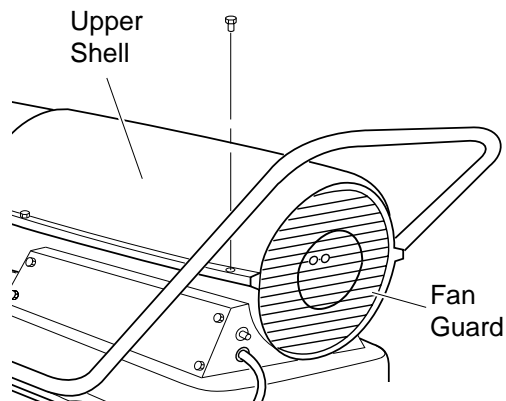


Figure 9 - Upper Shell Removal, 100/150,000 BTU/Hr Models

Fuel Filter

(70,000 BTU/Hr Model)

1. Remove side cover screws using 5/16" nut-driver.
2. Remove side cover.
3. Pull rubber fuel line off fuel filter neck.
4. Carefully pry bushing and fuel filter out of fuel tank.
5. Wash fuel filter with clean fuel and replace in tank.
6. Attach rubber fuel line to fuel filter neck.
7. Replace side cover.

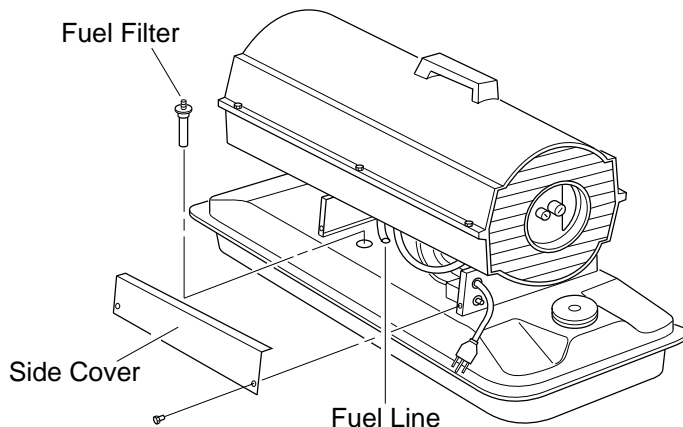


Figure 10 - Fuel Filter Removal, 70,000 BTU/Hr Model

Fuel Filter

(100/150,000 BTU/Hr Models)

1. Remove side cover screws using 5/16" nut-driver.
2. Remove side cover.
3. Pull upper fuel line off fuel filter neck.
4. Carefully pry bushing, lower fuel line, and fuel filter out of fuel tank.
5. Wash fuel filter with clean fuel and replace in tank.
6. Attach upper fuel line to fuel filter neck.
7. Replace side cover.

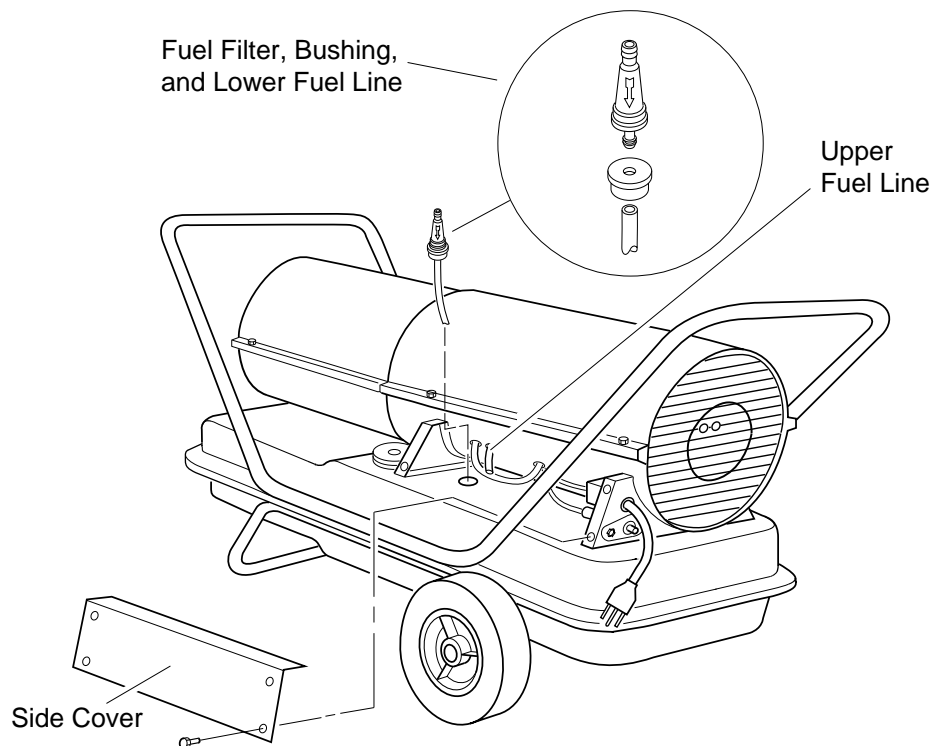


Figure 11 - Fuel Filter Removal, 100/150,000 BTU/Hr Models

Spark Plug

1. Remove upper shell (see page 10).
2. Remove fan (see page 15).
3. Remove spark plug wire from spark plug.
4. Remove spark plug from burner head using 13/16" open-end wrench.
5. Clean and regap spark plug electrodes as follows:
70,000 BTU/Hr model:
.055" (1.4 mm) gap,
100/150,000 BTU/Hr models: .075" (1.9 mm) gap.
6. Install spark plug in burner head.
7. Attach spark plug wire to spark plug.
8. Replace fan (see page 15).
9. Replace fan guard and upper shell.

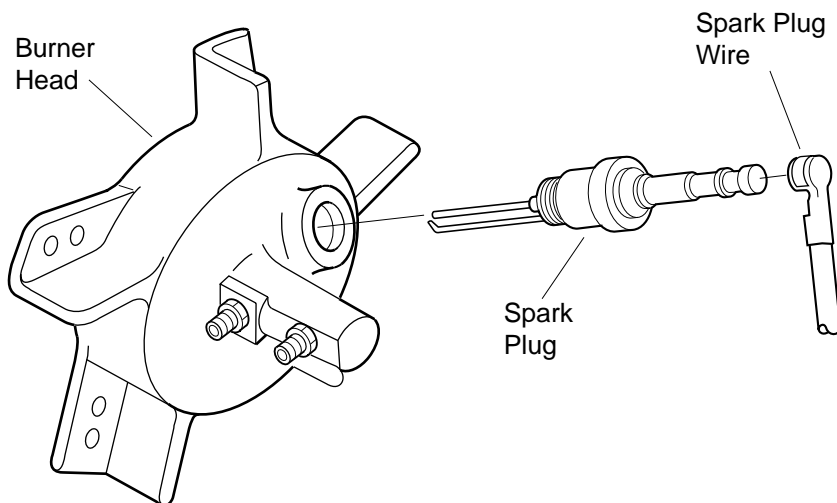


Figure 12 - Spark Plug Removal

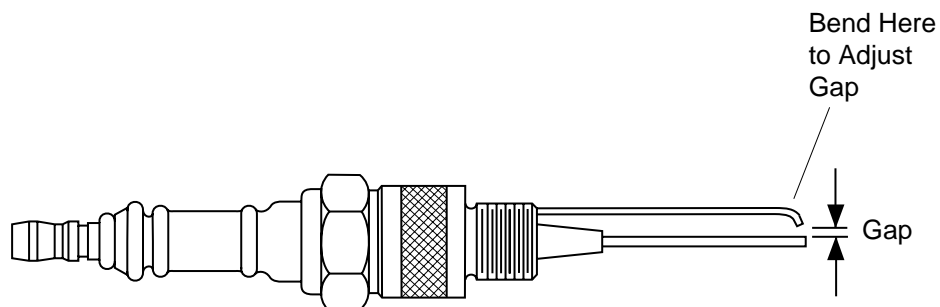


Figure 13 - Spark Plug Gap

Air Output, Air Intake, and Lint Filters

1. Remove upper shell (see page 10).
2. Remove filter end cover screws using 5/16" nut-driver.
3. Remove filter end cover.
4. Replace air output and lint filters.
5. Wash or replace air intake filter (see *Preventative Maintenance Schedule*, page 8).
6. Replace filter end cover.
7. Replace fan guard and upper shell.

IMPORTANT: Do not oil filters.

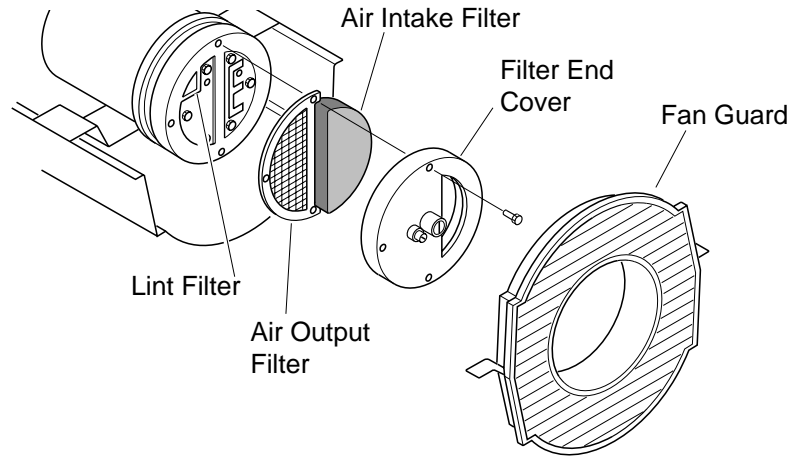


Figure 14 - Air Output, Air Intake, and Lint Filters, 70,000 BTU/Hr Model

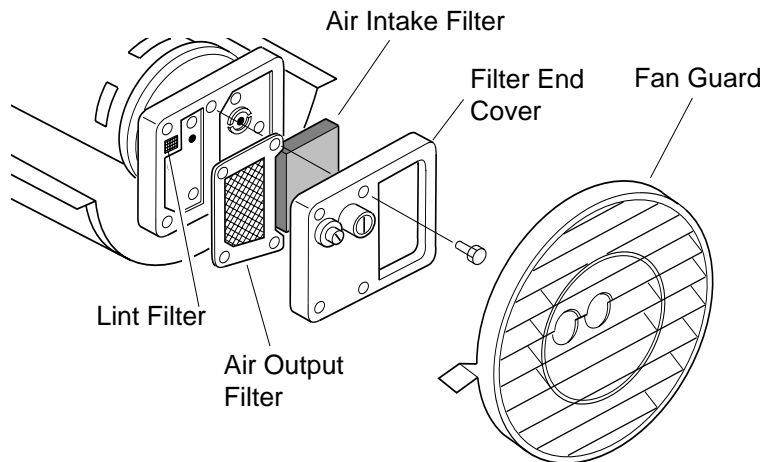


Figure 15 - Air Output, Air Intake, and Lint Filters, 100,000/150,000 BTU/Hr Models

Pump Pressure Adjustment

1. Remove pressure gauge plug from filter end cover.
2. Install accessory pressure gauge (part number HA1180).
3. Start heater (see *Operation*, page 7). Allow motor to reach full speed.
4. Adjust pressure. Turn relief valve to right to increase pressure. Turn relief valve to left to decrease pressure. See specifications at right for correct pressure for each model.
5. Remove pressure gauge. Replace pressure gauge plug in filter end cover.

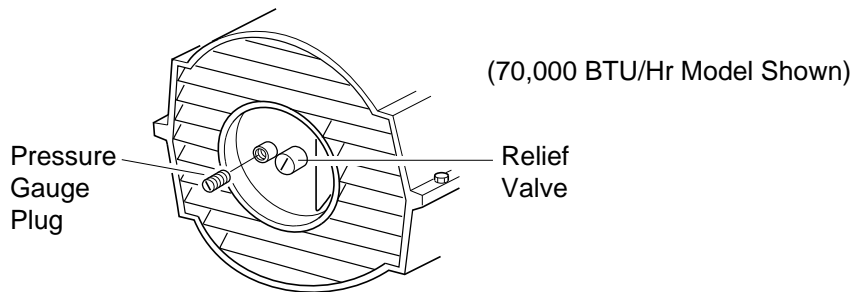


Figure 16 - Pressure Gauge Plug Removal

Model	Pump Pressure
70,000 BTU/Hr	4.5 PSI
100,000 BTU/Hr	4.5 PSI
150,000 BTU/Hr	4.9 PSI

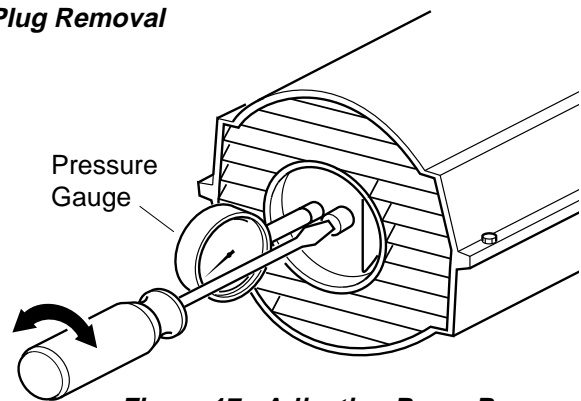


Figure 17 - Adjusting Pump Pressure

Nozzle

1. Remove upper shell (see page 10).
2. Remove fan (see page 15).
3. Remove fuel and air line hoses from burner head.
4. Remove spark plug wire from spark plug.
5. Remove spark plug from burner head using 13/16" open-end wrench.
6. Remove three screws using 5/16" nut-driver and remove burner head from combustion chamber.
7. Place burner head into vise and lightly tighten.
8. Carefully remove nozzle from burner head using 5/8" socket wrench (see Figure 19).
9. Blow compressed air through face of nozzle. This will free any dirt in nozzle area.
10. Inspect nozzle seal for damage.
11. Replace nozzle into burner head and tighten firmly (80-110 inch-pounds/9.1-12.4 n-m).
12. Attach burner head to combustion chamber.
13. Install spark plug in burner head.
14. Attach spark plug wire to spark plug.
15. Attach fuel and airline hoses to burner head.
16. Replace fan (see page 15).
17. Replace fan guard and upper shell.

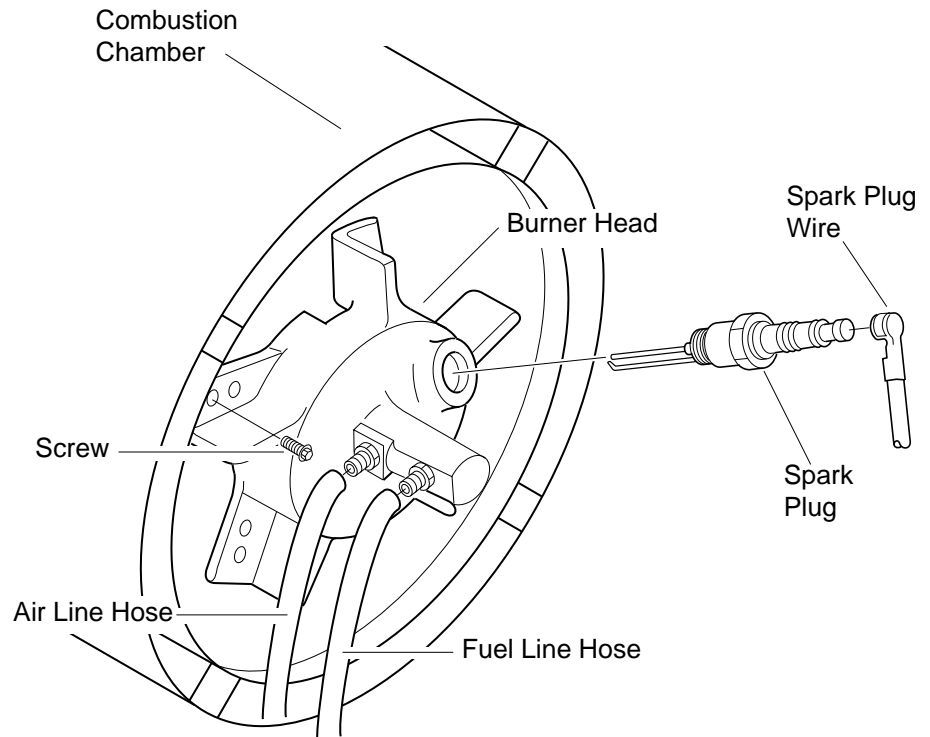


Figure 18 - Removing Burner Head

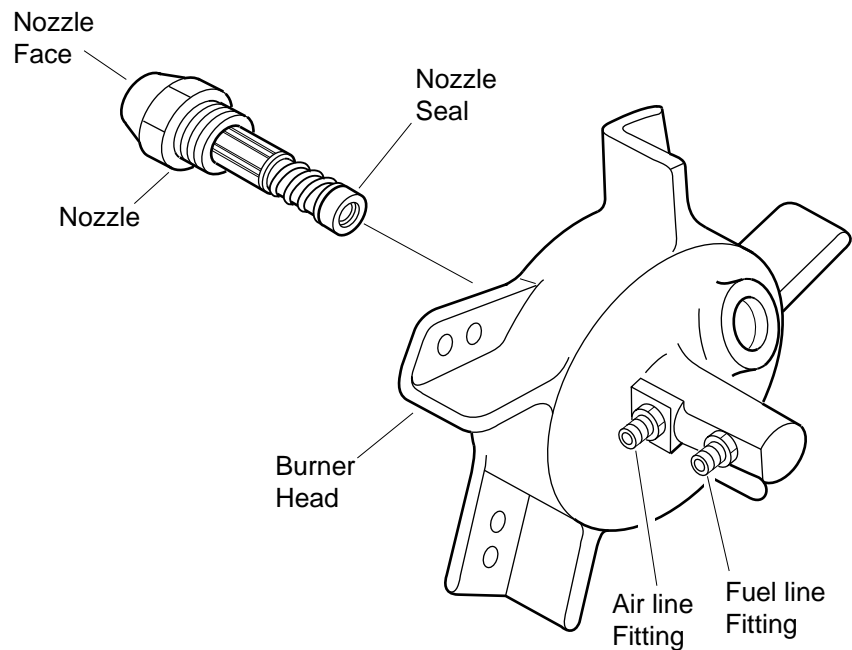


Figure 19 - Removing Nozzle

Pump Rotor

(Procedure if rotor is binding)

1. Remove upper shell (see page 10).
2. Remove filter end cover screws using 5/16" nut-driver.
3. Remove filter end cover and air filters.
4. Remove pump plate screws using 5/16" nut-driver.
5. Remove pump plate.
6. Remove rotor, insert, and blades.
7. Check for debris in pump. If debris is found, blow out with compressed air.
8. Install insert and rotor.
9. Check gap on rotor. Adjust to .003"/.004" (.076/.101 mm) if needed (see Figure 22).

Note: Rotate rotor one full turn to insure the gap is .003"/.004" (.076/.101 mm) at tightest position. Adjust if needed.

10. Install blades, pump plate, air filters, and filter end cover.
11. Replace fan guard and upper shell.
12. Adjust pump pressure (see page 12).

Note: If rotor is still binding, proceed as follows.

13. Perform steps 1 through 6 above.
14. Place fine grade sandpaper (600 grit) on flat surface. Sand rotor lightly in "figure 8" motion four times (see Figure 23).
15. Reinstall insert and rotor.
16. Perform steps 10 through 12 above.

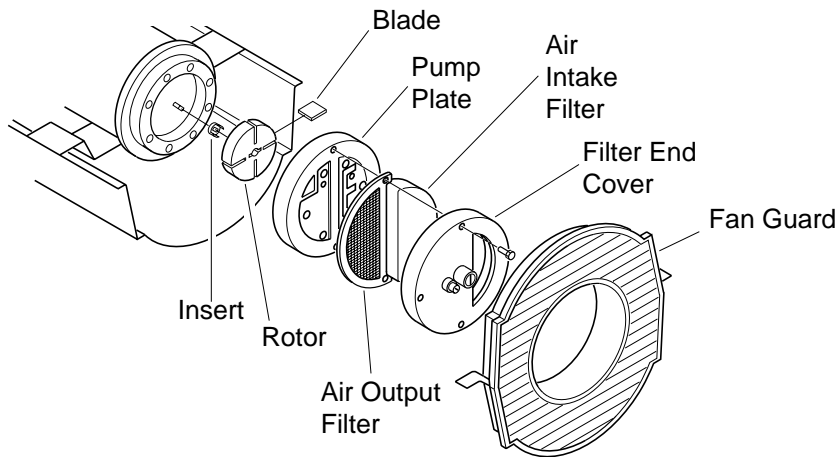


Figure 20 - Rotor Location, 70,000 BTU/Hr Model

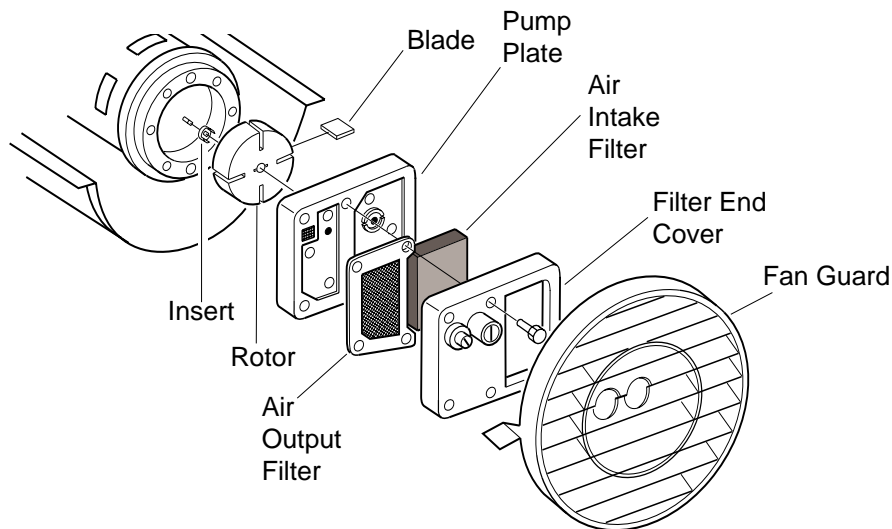


Figure 21 - Rotor Location, 100/150,000 BTU/Hr Models

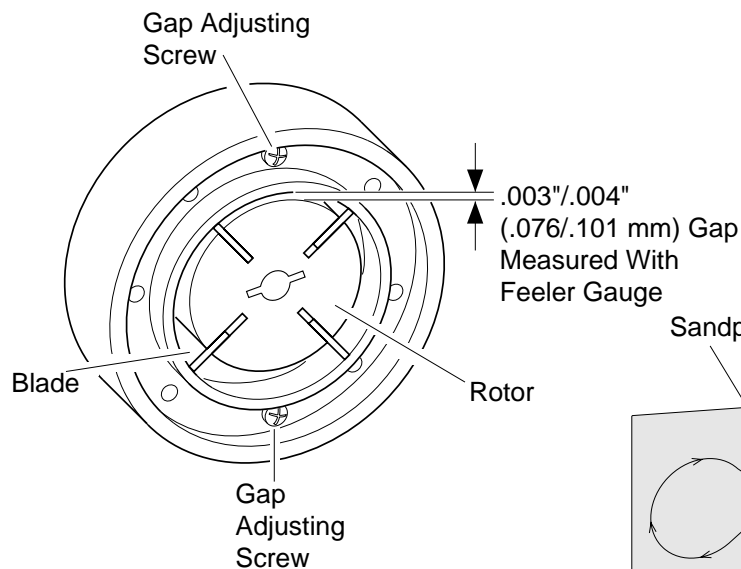


Figure 22 - Gap Adjusting Screw Locations

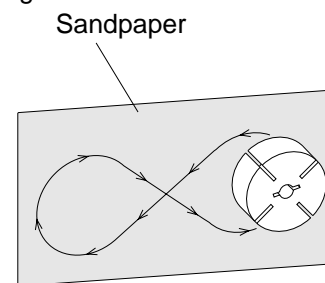


Figure 23 - Sanding Rotor

Fan

IMPORTANT: Remove fan from motor shaft before removing motor from heater. The weight of the motor resting on the fan could damage the fan pitch.

1. Remove upper shell (see page 10).
2. Use 1/8" allen wrench to loosen setscrew which holds fan to motor shaft.
3. Slip fan off motor shaft.
4. Clean fan using a soft cloth moistened with kerosene or solvent.
5. Dry fan thoroughly.
6. Replace fan on motor shaft. Place fan hub flush with end of motor shaft (see Figure 25).
7. Place setscrew on flat of shaft. Tighten setscrew firmly (40-50 inch-pounds/ 4.5-5.6 n-m).
8. Replace fan guard and upper shell.

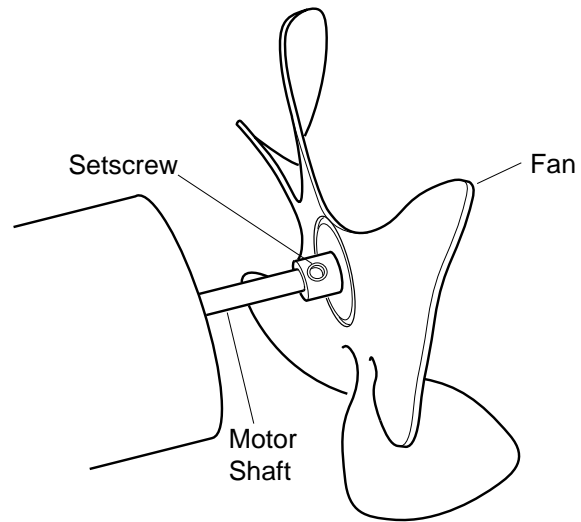


Figure 24 - Fan, Motor Shaft, and Setscrew Location

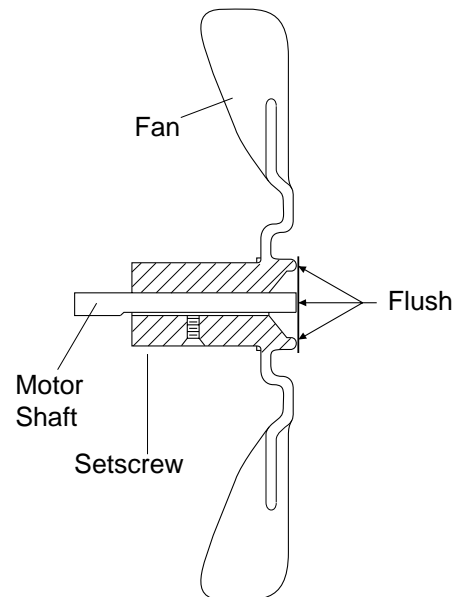


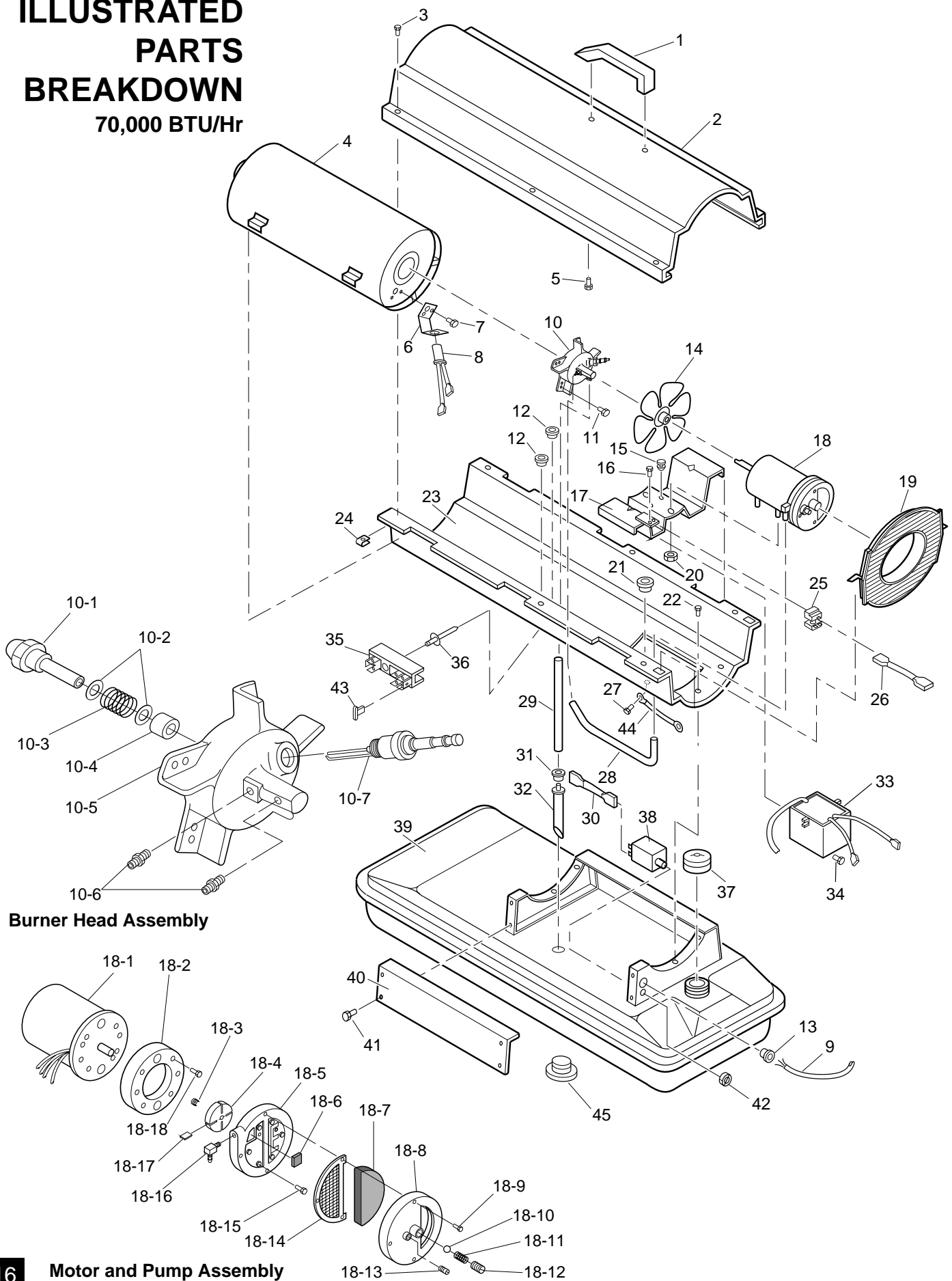
Figure 25 - Fan Cross Section

SPECIFICATIONS

Output Rating (BTU/Hr)	70,000	100,000	150,000
Fuel	Use Only Kerosene or No. 1 Fuel Oil		
Fuel Tank Capacity (U.S. Gal./Liters)	5.0/18.9	9.0/34.1	13.5/51.1
Fuel Consumption (Gal. Per Hr./Liters Per Hr.)	.52/1.97	.78/2.95	1.10/4.16
Electric Requirements	220 V/60 Hz (Same All Models)		
Amperage (Normal Run)	2.0	2.0	2.0
Hot Air Output (CFM/CMM)	250/7.1	490/13.9	500/14.2
RPM	3450	3450	3450

ILLUSTRATED PARTS BREAKDOWN

70,000 BTU/Hr



Burner Head Assembly

Motor and Pump Assembly

PARTS LIST

70,000 BTU/Hr

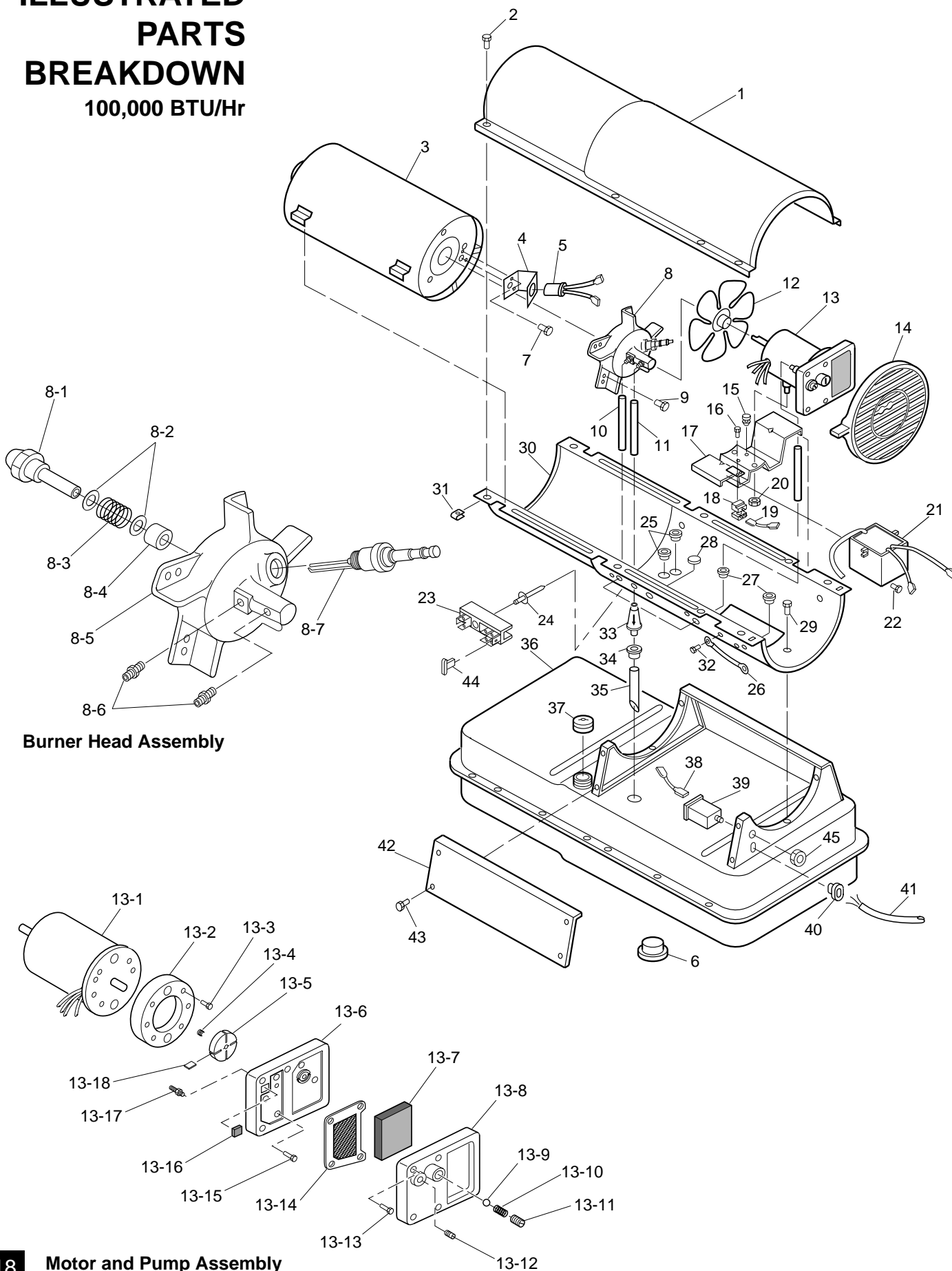
This list contains replaceable parts used in your heater. When ordering parts, be sure to provide the correct model and serial numbers (from the model plate), then the part number and description of the desired part.

KEY NO.	PART NUMBER	PART DESCRIPTION	QTY.	KEY NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	M51104-01	Handle	1	18-14	M29612-01	Output Filter	1
2	098511-54	Upper Shell	1	18-15	M12461-31	Screw, #10-32 x 1"	6
3	100647-01	Screw, #10-16 x 1/2"	6	18-16	M50016	Elbow, 90° (Barb Fitting)	1
4	098512-34	Combustion Chamber	1	18-17	M8643	Blade	4
5	M11084-29	Screw, #10-16 x 3/4"	2	18-18	FHPF3-2C	Screw, #10-32 x 1/4"	2
6	M16660	Photocell Bracket	1	19	M51105-01	Fan Guard	1
7	M10908-2	Screw, #6-32 x 3/8"	2	20	NTC-4C	Hex locknut	2
8	HA3019	Photocell Assembly	1	21	M50104-02	Bushing (wires)	1
9	099055-07	Power Cord	1	22	M11084-26	Screw, #10-16 x 3/8"	6
10	**	Burner Head Assembly	1	23	098511-12	Lower Shell	1
10-1	M50880-01	Nozzle	1	24	M11271-8	Clip Nut	6
10-2	M10659-1	Nozzle Seal Washer	2	25	M12462-15	Relay (motor start)	1
10-3	M10809-1	Nozzle Seal Spring	1	26	M16841-58	Wire Assembly (red 9 1/2")	1
10-4	M8882	Nozzle Seal Sleeve	1	27	M15823-39	Screw, #8-18 x 1/2"	1
10-5	M51098-02	Burner Head Body	1	28	M29652-04	Rubber Airline	1
10-6	M50820-01	Barb Fitting	2	29	079973-01	Fuel Line	1
10-7	M10962-2	Spark Plug	1	30	M16841-57	Wire Assembly (red 8 1/2")	1
11	M11084-27	Screw, #10-16 x 1/2"	3	31	M10990-3	Rubber Bushing	1
12	M30865-02	Bushing	2	32	M50876-05	Fuel Filter Assembly (Includes bushing)	1
13	M11143-1	Strain Relief Bushing	1	33	098557-07	Electronic Ignitor	1
14	101587-01	Fan	1	34	M11084-29	Screw, #10-16 x 3/4"	2
15	M50631	Rubber Bumper	2	35	099125-02	Terminal Board	1
16	M12461-13	Screw, #8-32 x 1/4" (holds relay in position)	2	36	099157-01	Rivet	1
17	098138-01	Motor and Relay Bracket Assembly	1	37	097702-01	Fuel Tank Cap	1
18	**	Motor and Pump Assembly	1	38	097630-02	Flame-Out Control	1
18-1	099656-02	Motor (220V/60Hz)	1	39	098513-62	Fuel Tank	1
18-2	079975-02	Pump Body	1	40	M50899-03AA	Side Cover	1
18-3	M22009	Insert	1	41	M11084-26	Screw, #10-16 x 3/8"	2
18-4	M22456-1	Rotor	1	42	099177-01	Hex Nut	1
18-5	M29608	End Pump Cover	1	43	078918-01	Terminal Board Tab Cap	1
18-6	M29632	Lint Filter	1	44	M9900-162	Wire Assembly (green 16")	1
18-7	M29633	Intake Filter	1	45	M27417	Drain Plug	1
18-8	M29609	End Filter Cover	1	PARTS AVAILABLE - NOT SHOWN			
18-9	M12461-31	Screw, #10-32 x 1"	3		M18053	Filler Neck Screen	1
18-10	M8940	Steel Ball (1/4" Dia.)	1		098227-53	Wiring Decal	1
18-11	M10993-1	Pressure Relief Spring	1		097649-01	Tradename Decal	2
18-12	M27694	Adjusting Screw	1		098493-01	General Information Decal	1
18-13	M22997	Plug	1				

**Not available as an assembly, order parts separately.

ILLUSTRATED PARTS BREAKDOWN

100,000 BTU/Hr



Burner Head Assembly

PARTS LIST

100,000 BTU/Hr

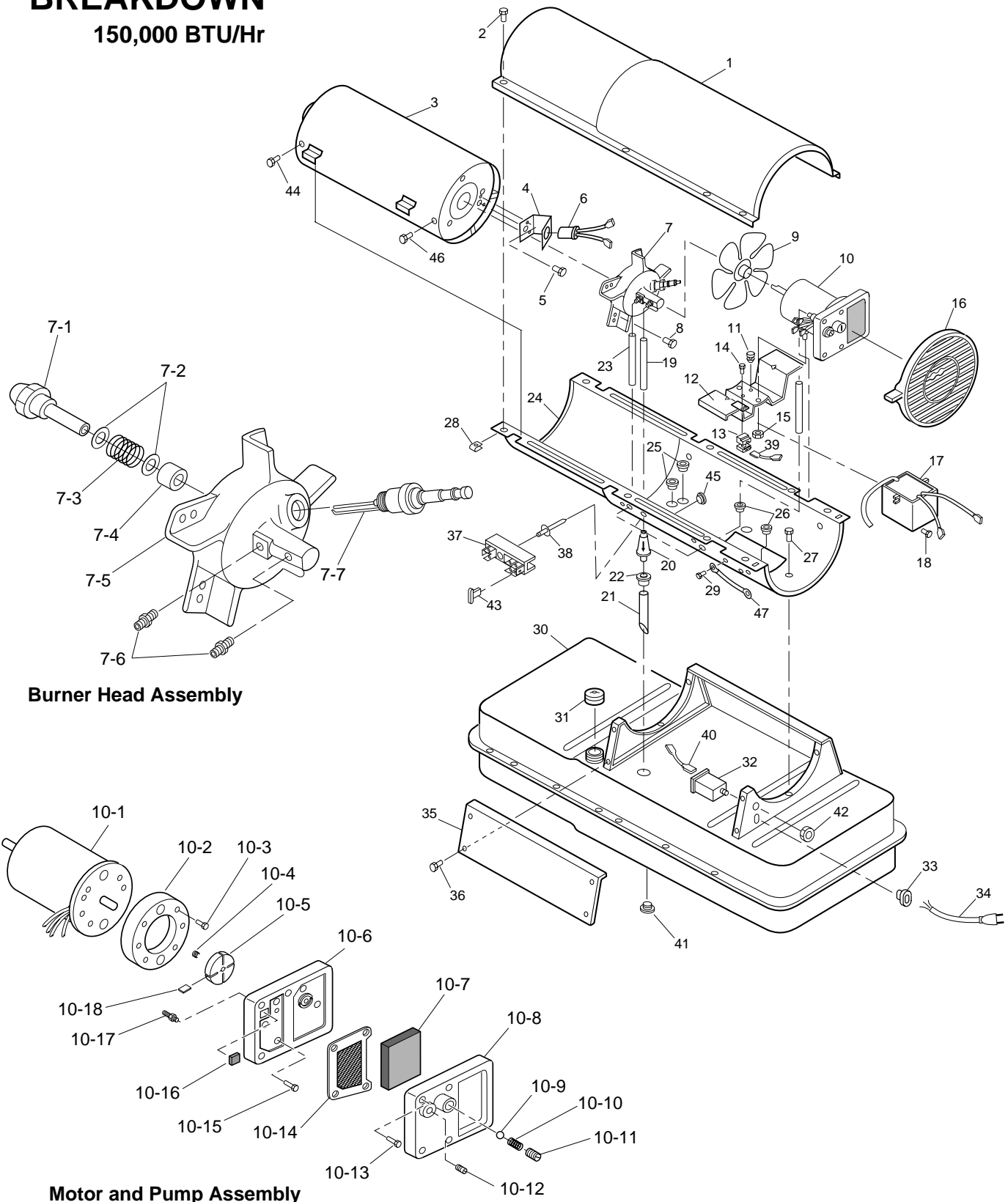
This list contains replaceable parts used in your heater. When ordering parts, be sure to provide the correct model and serial numbers (from the model plate), then the part number and description of the desired part.

KEY NO.	PART NUMBER	PART DESCRIPTION	QTY.	KEY NO.	PART NUMBER	PART DESCRIPTION	QTY.
1	098511-138	Upper Shell	1	15	M50631	Rubber Bumper	2
2	100647-01	Screw, #10-16 x 1/2"	8	16	M12461-13	Screw, #8-32 x 1/4"	2
3	098512-31	Combustion Chamber	1	17	098138-02	Motor and Relay	
4	M16660	Photocell Bracket	1			Bracket Assembly	1
5	HA3019	Photocell Assembly	1	18	M12462-15	Relay (motor start)	1
6	M27417	Drain Plug	1	19	M16841-59	Wire Assembly (red 13 1/2")	1
7	M10908-2	Screw, #6-32 x 3/8"	2	20	NTC-4C	Hex locknut	2
8	**	Burner Head Assembly	1	21	098557-07	Electronic Ignitor	1
8-1	M23103	Nozzle	1	22	M11084-29	Screw, #10-16 x 3/4"	2
8-2	M10659-1	Nozzle Seal Washer	2	23	099125-02	Terminal Board	1
8-3	M10809-1	Nozzle Seal Spring	1	24	099157-01	Rivet	1
8-4	M8882	Nozzle Seal Sleeve	1	25	M50104-03	Bushing	2
8-5	M50924-03	Burner Head Body	1	26	M9900-192	Wire Assembly (green 16")	1
8-6	M50820-02	Barb Fitting	2	27	M50104-01	Bushing	2
8-7	M10962-2	Spark Plug	1	28	099213-01	Button Plug	1
9	M11084-27	Screw, #10-16 x 1/2"	3	29	M11084-27	Screw, #10-16 x 1/2"	6
10	M50814-06	Air Line	1	30	098511-140	Lower Shell	1
11	M51345-01	Fuel Line	1	31	M11271-8	Clip Nut	8
12	097293-01	Fan	1	32	M15823-39	Screw, #8-18 x 1/2"	1
13	**	Motor and Pump Assembly	1	33	M51150-01	Fuel filter	1
13-1	099656-01	Motor (220V/60Hz)	1	34	M10990-3	Rubber Bushing	1
13-2	079975-02	Pump Body	1	35	M51151-01	Fuel Line	1
13-3	FHPF3-2C	Screw, #10-32 x 1/4"	2	36	098513-21	Fuel Tank	1
13-4	M22009	Insert	1	37	097702-01	Fuel Tank Cap	1
13-5	M22456-1	Rotor	1	38	M16841-57	Wire Assembly (red 8 1/2")	1
13-6	M50545	End Pump Cover	1	39	097630-02	Flame-Out Control	1
13-7	M12179	Intake Filter	1	40	M11143-1	Strain Relief Bushing	1
13-8	M16545	End Filter Cover	1	41	099055-07	Power Cord	1
13-9	M8940	Steel Ball (1/4" Dia.)	1	42	M51077-01AA	Side Cover	1
13-10	M10993-1	Pressure Relief Spring	1	43	M11084-27	Screw, #10-16 x 1/2"	4
13-11	M27694	Adjusting Screw	1	44	078918-01	Terminal Board Tab Cap	1
13-12	M22997	Plug	1	45	099177-01	Hex Nut	1
13-13	M12461-31	Screw, #10-32 x 1"	4	PARTS AVAILABLE - NOT SHOWN			
13-14	M12244-1	Output Filter	1				
13-15	M12461-31	Screw, #10-32 x 1"	6		M18053	Filler Neck Screen	1
13-16	M11637	Lint Filter	1		098227-53	Wiring Decal	1
13-17	M50820-02	Barb Fitting	1		097650-01	Tradename Decal	2
13-18	M8643	Blade	4		098493-01	General Information Decal	1
14	M51114-01	Fan Guard	1				

**Not available as an assembly, order parts separately.

ILLUSTRATED PARTS BREAKDOWN

150,000 BTU/Hr



Burner Head Assembly

Motor and Pump Assembly

PARTS LIST

150,000 BTU/Hr

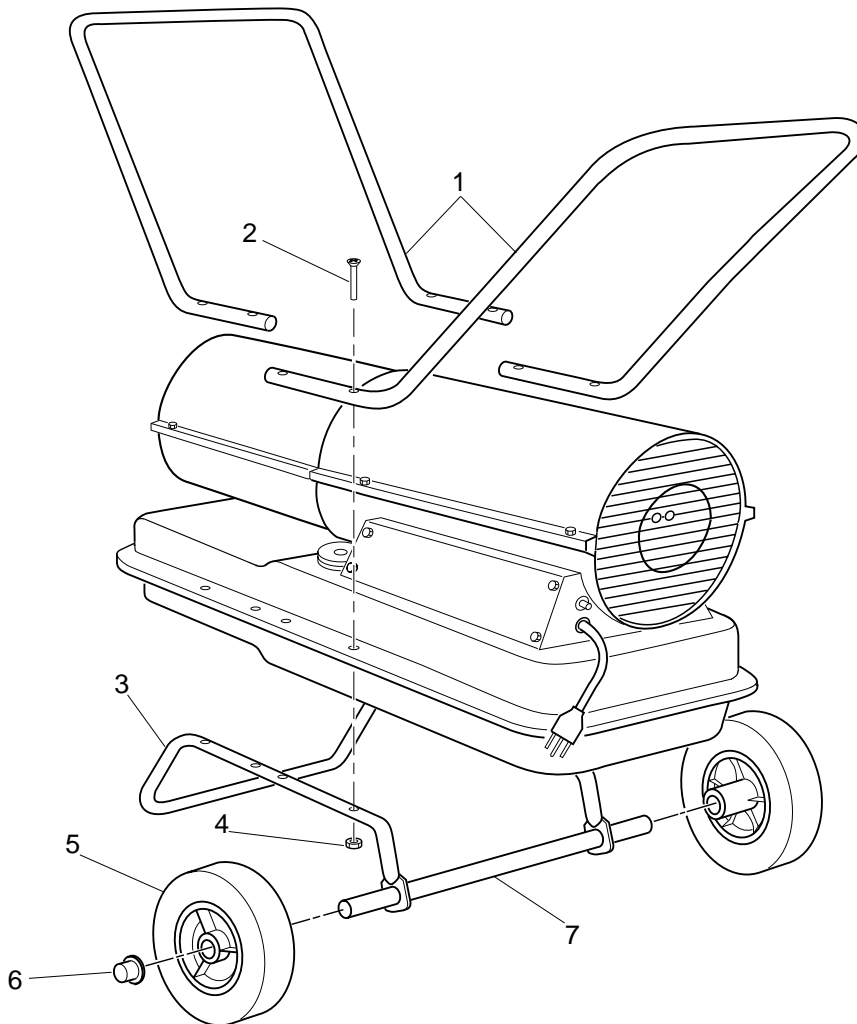
This list contains replaceable parts used in your heater. When ordering parts, be sure to provide the correct model and serial numbers (from the model plate), then the part number and description of the desired part.

KEY NO.	PART NUMBER	DESCRIPTION	QTY.	KEY NO.	PART NUMBER	DESCRIPTION	QTY.
1	098511-138	Upper Shell	1	17	098557-07	Ignitor Kit	1
2	100647-01	Screw, #10-16 x 1/2"	8	18	M11084-29	Screw, #10-16 x 3/4"	2
3	098512-29	Combustion Chamber	1	19	M51345-02	Fuel Line	1
4	099229-01	Photocell Bracket	1	20	M51150-01	Fuel Filter	1
5	M10908-2	Screw, #6-32 x 3/8"	2	21	M51151-02	Fuel Line Tube	1
6	HA3019	Photocell Assembly	1	22	M10990-3	Rubber Bushing	1
7	**	Burner Head Assembly	1	23	M50814-03	Air Line	1
7-1	HA3010	Nozzle with Sleeve	1	24	098511-140	Lower Shell	1
7-2	M10659-1	Nozzle Washer	2	25	M50104-03	Bushing	2
7-3	M10809-1	Nozzle Spring	1	26	M50104-01	Bushing	2
7-4	M8882	Nozzle Sleeve	1	27	M11084-27	Screw, #10-16 x 1/2"	6
7-5	M50924-03	Burner Head Body	1	28	M11271-8	Clip Nut	8
7-6	M50820-02	Barb Fitting	2	29	M15823-39	Screw, #8-18 x 1/2"	1
7-7	HA3012	Spark Plug	1	30	098513-56	Fuel Tank	1
8	M11084-27	Screw, #10-16 x 1/2"	3	31	097702-01	Fuel Tank Cap	1
9	097293-01	Fan	1	32	097630-02	Flame-Out Control	1
10	**	Motor and Pump Assembly	1	33	M11143-1	Strain Relief Bushing	1
10-1	099656-01	Motor (220V/60Hz)	1	34	099055-07	Power Cord	1
10-2	079975-02	Pump Body	1	35	M51077-01AA	Side Cover	1
10-3	FHPF3-2C	Screw #10-32 x 1/4"	2	36	M11084-27	Screw, #10-16 x 1/2"	4
10-4	M22009	Rotor Insert	1	37	099125-03	Terminal Board	1
10-5	M22456-1	Pump Rotor	1	38	099157-01	Rivet	1
10-6	M50545	Pump End Cover	1	39	M16841-59	Wire Assembly (Red, 13 1/2")	1
10-7	M12179	Intake Filter	1	40	M16841-57	Wire Assembly (Red, 6")	1
10-8	M16545	Filter End Cover	1	41	M27417	Drain Plug (Includes "O" Ring)	1
10-9	M8940	Steel Ball, 1/4" diameter	1	42	099177-01	Hex Nut	1
10-10	M10993-1	Relief Spring	1	43	078918-01	Tab Cap	1
10-11	M27694	Adjusting Screw	1	44	099230-01	Screw, #10-16 x 3/8"	2
10-12	M22997	Plug	1	45	099213-01	Button Plug	1
10-13	M12461-31	Screw #10-32 x 1"	4	46	M11084-27	Screw, #10-16 x 1/2"	2
10-14	M12244-1	Output Filter	1	47	M9900-192	Wire Assembly (Green, 16")	1
10-15	M12461-31	Screw, #10-32 x 1"	6				
10-16	M11637	Lint Filter	1				
10-17	M50820-02	Barb Fitting	1				
10-18	M8643	Blade	4				
11	M50631	Rubber Bumper	2	PARTS AVAILABLE - NOT SHOWN			
12	098138-02	Motor Mounting Bracket	1				
13	M12462-15	Motor Start Relay	1		M18053	Filler Neck Screen	1
14	M12461-13	Screw, #8-32 x 1/4"	2		097650-01	Tradename Decal	2
15	NTC-4C	Hex Lock Nut, 1/4-20	2		098493-01	General Information Decal	1
16	M51114-01	Fan Guard	1		098227-53	Wiring Decal	1

** Not available as an assembly. Order parts separately.

WHEELS AND HANDLES FOR 100,000 AND 150,000 BTU/Hr MODELS

KEY NO.	PART NUMBER	PART DESCRIPTION	100,000 QTY.	150,000 QTY.
1	HA2203	Handles	2	—
	HA2204	Handles	—	2
2	M12345-33	Screw, #10-24 x 1 3/4"	8	8
3	M12342-3	Wheel Support Frame	1	—
	M12831-3	Wheel Support Frame	—	1
4	NTC-3C	Hex Nut, #10-24	8	8
5	097896-01	Wheel	2	2
6	M28526	Cap Nut	2	2
7	M51015-01	Axle	1	—
	M16801-2	Axle	—	1



WIRING DIAGRAMS

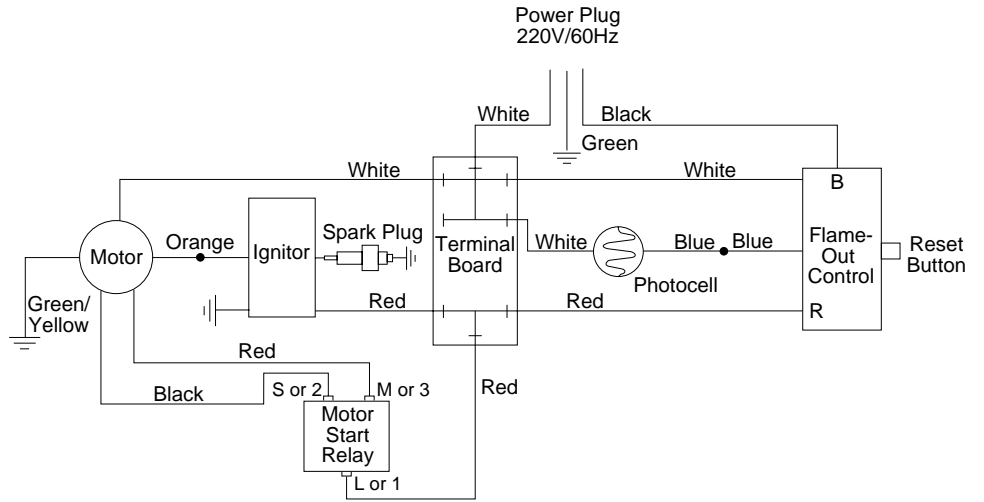
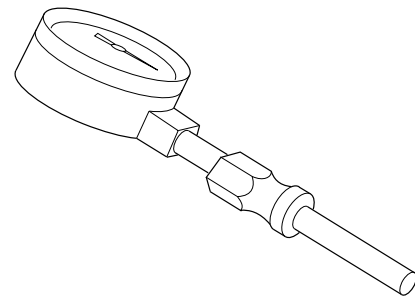


Figure 26 - Wiring Diagram

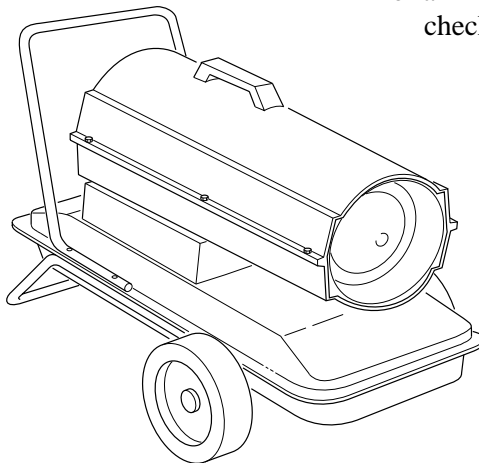
ACCESSORIES

Purchase accessories from your local dealer.



AIR GAUGE KIT - HA1180

For all models. Special tool to check pump pressure.



HEAVY DUTY WHEELS AND HANDLE KIT - HA1202

For heavy duty applications. Makes your heater even more portable and convenient. For 70,000 BTU/Hr model only.

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Always specify model and serial numbers when communicating with the factory.

We reserve the right to amend these specifications at any time without notice. The only Warranty applicable is our standard written Warranty. We make no other Warranty, expressed or implied.

A Service Manual is available by writing to the Technical Service Department at:

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Bowling Green, Kentucky 42102-9004
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